

REMARKS

Claims 1-8 are pending in the application. Claims 1-2 have been withdrawn as being directed to a non-elected invention.

The Office Action rejects claims 3-8 under 35 U.S.C. § 103(a) as being obvious over Inoue (JP 2000-233625). The Office Action also rejects claims 3-8 under 35 U.S.C. § 103(a) as being obvious over Siecinski et al. (U.S. Patent No. 6,206,392) in view of Brown (U.S. Patent No. 4,854,150). These rejections are traversed.

In the presently claimed invention, a hollow stabilizer has been “formed by bending a material obtained by compressing an electroseamed pipe to reduce a diameter thereof in a temperature range of a hot state or a warm state so as to make a ratio of **thickness of more than 27%** up to 35% with respect to an outer diameter...” (excerpt of claim 3, emphasis added).

In direct contrast, Inoue et al. is directed to a hollow stabilizer with the object “[t]o satisfy a sufficiently lighter weight and durability by cold drawing a raw tube...having a thickness ratio within a specified range” (see the English language abstract). Inoue et al. actually teaches against the presently claimed ratio of **thickness of more than 27%**, stating that “[p]rocessing to a wall-thickness ratio exceeding 0.27 is difficult to be realized by a current pipe drawing processing techniques using a die, and **weight saving merit is lost**” (paragraph [0035] of the English language translation, emphasis added). Applicants respectfully submit that one of skill in the art would not have been motivated to destroy the object of Inoue et al. (to satisfy a sufficiently lighter weight) by using a weight ratio such that “weight saving merit is lost.”

Furthermore, as noted in the U.S. Patent and Trademark Office Manual of Patent Examining Procedure (MPEP), if the “proposed modification would render the prior art invention being modified unsatisfactory for its intended use, then there is no suggestion or motivation to make the proposed modification” (MPEP 2143.01). Thus, the proposed modification to add thickness would render the prior art invention unsatisfactory for its intended use “to satisfy a sufficient lighter weight.” Thus, Applicants further submit that there is no suggestion or motivation to make the proposed modification.

Additionally, as also noted in the MPEP, “[a] prima facie case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention” (MPEP 2144.05 III). Applicants respectfully submit that Inoue et al. teaches against the claimed invention by stating that a ratio such as that required in the present claims results in weight saving merit being lost.

Thus, Applicants respectfully submit that it would not have been obvious for one of skill in the art to modify the teachings of Inoue et al. to replace the lighter weight ratio of Inoue et al. with the higher ratio that Inoue et al. teaches against (weight saving merit being lost).

Therefore, Applicants respectfully submit that the presently claimed invention, which requires a thickness of more than 27% would not have been obvious over Inoue et al.

Furthermore, paragraph [0035] in Inoue mentions that “Processing to a wall-thickness ratio exceeding 0.27 is difficult to be realized by a current pipe drawing processing techniques using a die, and weight saving merit is lost.”, and this description denies the range of the invention. Therefore, it cannot be determined that the present

invention is obvious from Inoue because of the description. Since the wall-thickness ratio of Siecinski is 25% or less, it cannot be determined that the wall-thickness ratio of more than 27% is obvious.

As mentioned in paragraph [0035] of Inoue, a hollow stabilizer having a wall-thickness ratio over 27% has not been provided, since materials having such a large wall-thickness ratio is difficult to produce and obtain and it has been believed that there is no weight saving merit. However, the materials can be easily obtained by the present invention, that is, by compressing an electroseamed pipe in a temperature range of a hot state or a warm state and since the inventors found that about 10% weight saving merit with respect to solid stabilizers can be obtained even if the wall-thickness ratio is 35%.

In the present invention, since the wall-thickness ratio is high, compression of the bent portion in bending of a material for formation of a hollow stabilizer can be prevented. When the wall-thickness ratio is low, a bender such as an NC bender in which bending is performed to every bending portion in order must be used to prevent compression. In contrast, solid stabilizers are formed by bending respective portions to be formed in a lump by using general bending molds. Since the present invention has high wall-thickness ratio, the stabilizer can be bent by the same manner as in the solid stabilizers and can shorten the forming tact.

The attached Fig. 1 shows a portion of a general bending mold. In the general bending mold, a flat die 1 (Fig. 2A) or a grooved die 2 (Fig. 2B) is used. The grooved die 2 can prevent compression of a pipe material 3.

The attached Fig. 3 shows hot working limit for hollow stabilizer using the flat die 1 of the general bending mold. In Fig. 3, “t” is wall-thickness of a material and “D0” is the outer diameter of the material, and “t/D0” is the wall-thickness ratio. In Fig. 3, “R” is the inner bending radius of the bent portion of the material. As is clearly understood from Fig. 3, bending is difficult when “R/D0” is small, and “R/D0” is set to be 1.5 or more when a solid stabilizer is designed.

Furthermore, the hot working limit for the hollow stabilizer in Fig. 3 is explained as follows. Compression ratio (%) is defined by the below equation. It should be noted that compression of bent portions results in increase of stress and decrease of durability of stabilizers.

Compression ratio (%) = (outer diameter of material – minimum outer diameter of bent portion)/outer diameter of material

In design of hollow stabilizers, the compression ratio may be required to be 15% or less, and may be required to be 10% or less in more severe case. Design of hollow stabilizers is performed in the upper sides of the continuous line (10%) and the broken line (15%) in Fig. 3. If hollow stabilizers are designed in the lower sides of the continuous line (10%), the compression ratio will be more than 10%.

As shown in Fig. 3, when the wall-thickness ratio is 0.27 or more, the compression ratio is 10% or less over the entire range for design of solid stabilizer (the range in which R/D0 is 1.5 or more). Therefore, hollow stabilizers can be designed by completely the same standards for solid stabilizers. Moreover, hollow stabilizers can be bent by the same manner (use of general bending mold) as in solid stabilizers.

Specifically, flat dies can be used and expensive grooved dies and complicated roller dies are not required in use of the general bending mold.

Particularly, regarding the combination of Siecinski et al. and Brown et al., as the Examiner notes "Siecinski ...teaches a thickness in the range 10-25% of the diameter... [and] does not teach a thickness greater than 25%" (see page 3 of the Office Action). Brown et al. also does not teach or suggest such a thickness.

Applicants respectfully submit that Siecinski et al. (and thus the asserted combination thereof with Brown) fails to recognize the unexpected results achieved by maintaining the thickness in the presently claimed range. In particular, the present specification describes a "durability test of a thin pipe in which the thickness ratio is 11.7% [within the range taught by Siecinski et al.] and a thick pipe in which the thickness ratio is 27.6% [outside the range taught by Siecinski et al. and within the presently claimed range]. In this durability test, all of the hollow stabilizers made of thin pipes broke at the starting point of the outer surface portion. Furthermore, the number of durability of the hollow stabilizer made of a thin pipe is between 41000 and 67000, and in contrast, the number of durability of the hollow stabilizer made of a thick pipe is between 340000 and 785000, which is substantially ten times the number of durability in the case of the thin pipe" (see the paragraph extending from page 13 to page 14 of the present specification).

As noted in the MPEP, "Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. 'The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims...In such a situation, the applicant

must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range” (MPEP 2144005 III).

Although the present range does not overlap with that of Siecinski et al., we believe that the above-discussed example demonstrates the unexpected results and advantages achieved by using a thickness ratio within the presently claimed range in comparison with a thickness ratio within the range taught by Siecinski et al.

Thus, as the presently claimed invention provides unexpected results and advantages that are not taught, suggested or recognized by Siecinski et al. (alone or in combination with Brown et al.), Applicants respectfully submit that the presently claimed invention would not have been obvious over Siecinski et al. and Brown et al.

For at least the above reasons, reconsideration and withdrawal of the rejections of claims 3-8 under 35 U.S.C. § 103(a) are respectfully requested.

Applicant respectfully submits that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300, **referencing attorney docket number 108421-00036.**

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert K. Carpenter", written over a horizontal line.

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